

The Vaccine Activation Measure (VAM™): Validation of a new segmentation tool for understanding vaccine hesitance and confidence

Moon Z^{1,2}, Auyeung V^{1,2}, Grimmett C², Harley M³, Peters JA³, Bodini S², Gray R², Crawshaw J^{2,4}, Horne R¹

1. Centre of Behavioural Medicine, UCL School of Pharmacy, University College London, UK; 2. Personia Health, a UCL Business Company, UK; 3. AstraZeneca, UK; 4. Ottawa Hospital Research Institute, Canada



Introduction

The childhood flu vaccination program in England has been established for many years, but uptake is sub-optimal (45-50%) and there is disparity in uptake across the country.¹ There is a need for urgent targeted interventions and tools to better understand vaccine hesitancy and improve uptake².

Methods

This was a cross-sectional survey of a representative sample of parents in England offered flu vaccination for their child. Parents were recruited through a market research panel and completed a self-reported online survey covering measures around beliefs about vaccines and sociodemographic characteristics (Figures 1 and 2). Participants self-reported whether they had ever accepted or declined the childhood flu vaccination for their child (Figure 3)*.

The VAM™ applies the Necessity Concerns Framework³ to identify the key beliefs influencing vaccine activation and engagement. Vaccine Necessity and Concerns are assessed using the VAX-NC™ questionnaire adapted from the Beliefs about Medicines Questionnaire™⁴. Parents were segmented into 4 categories of vaccine activation, with Level 4 indicating the highest level of activation. To establish the predictive value of the VAM™, a binary logistic regression analysis was run to identify the odds of vaccination at each level of the VAM™, controlling for key sociodemographic characteristics.

Results and Discussion

Data from 1,494 parents of children 2-16 years from England were analysed.

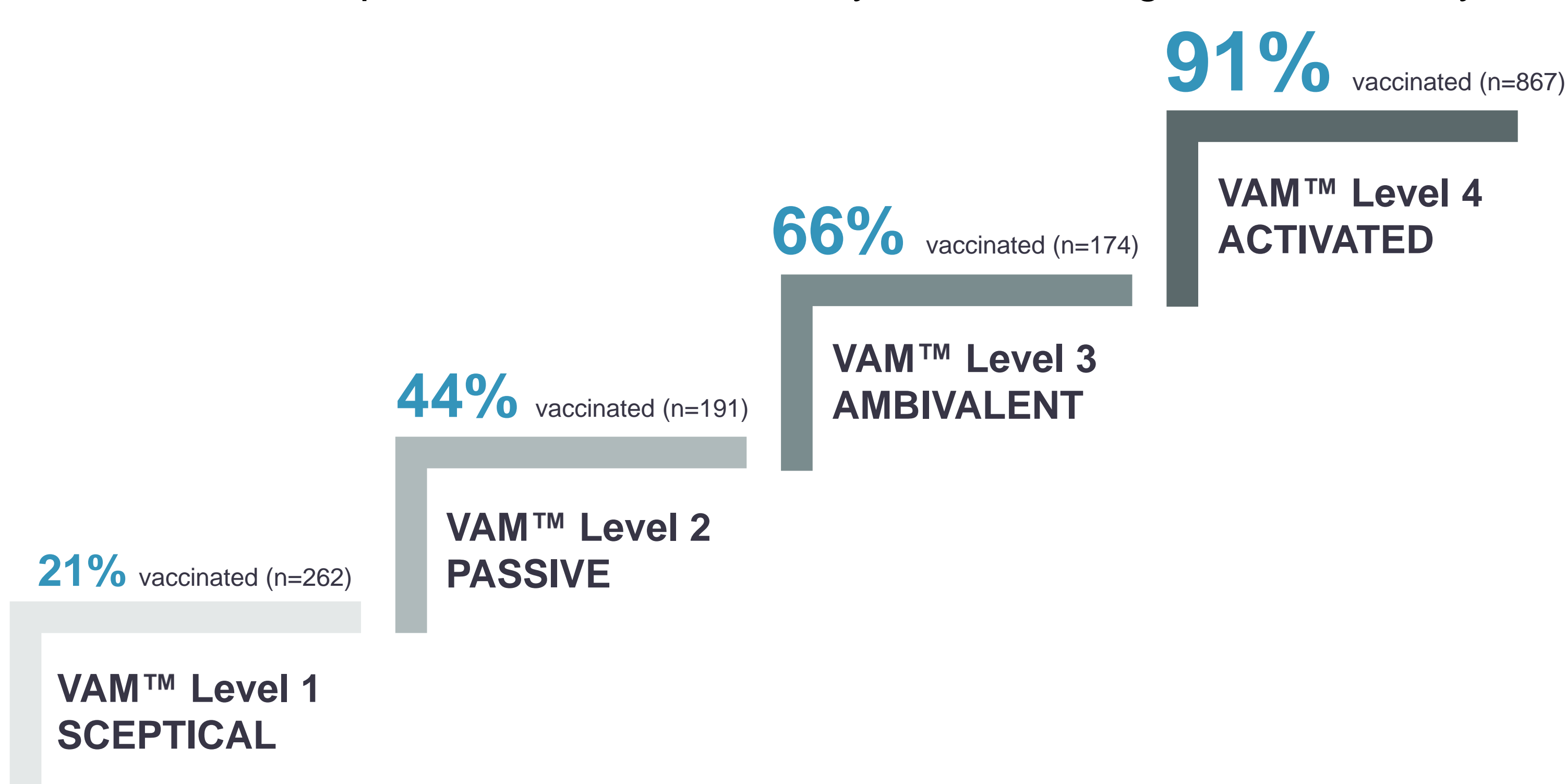
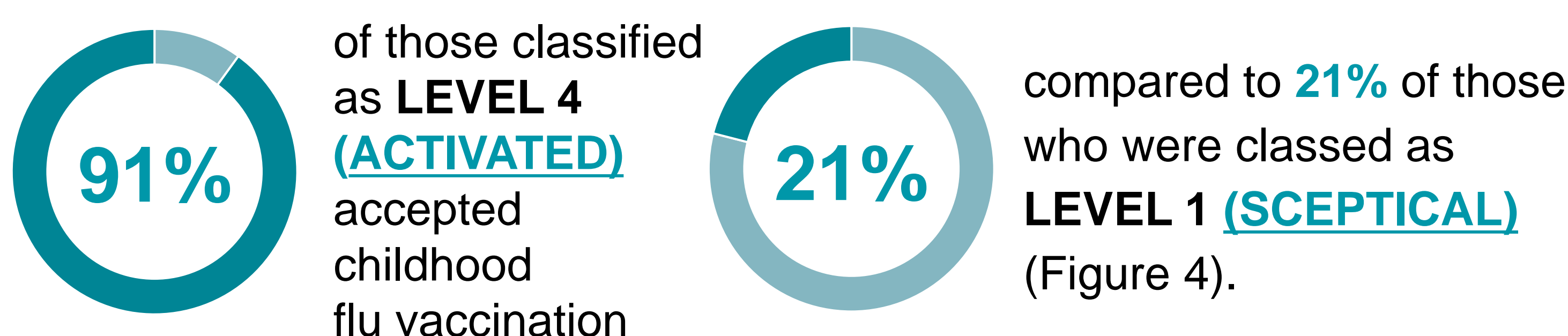


Figure 4: Vaccine Activation Ladder: 4 levels derived from VAM™ scores.



Childhood flu vaccine acceptance was predicated by the VAM™, with higher VAM™ scores associated with higher rates of vaccine uptake. In the logistic regression model, sociodemographic variables accounted for 4% of the variation in vaccination. **Inclusion of VAM™ increased this to 52%.**

When controlling for gender, ethnicity, household income and education, the odds of being vaccinated were **57 times higher for those at Level 4 compared to those at Level 1**. The odds were **2.97 (1.89-4.70) times and 24.6 (12.38-48.89) times higher for those in Level 2 and 3**.

| Covariate | Odds Ratio (95% CI) | P value | |
|---------------------------------------|---------------------|---------|--------------------------------|
| Income (continuous) | 1.00 (0.83-1.21) | 0.598 | Block 1 R ² = 0.036 |
| Education (university degree vs less) | 0.68 (0.46-1.00) | 0.009 | |
| Ethnicity (white vs non-white) | 1.64 (1.03-2.62) | 0.192 | Block 2 R ² = 0.042 |
| VAM™ Level 1 | REF | | |
| VAM™ Level 2 | 2.97 (1.89-4.70) | <0.001 | Block 3 R ² = 0.519 |
| VAM™ Level 3 | 24.6 (12.38-48.89) | <0.001 | |
| VAM™ Level 4 | 57.1 (36.12-90.48) | <0.001 | |

N=1246 (missing data ethnicity and income)

Table 1: Binary logistic regression.

Aim

The Vaccine Activation Measure (VAM™) is a new tool which segments people into four activation levels based on their beliefs about vaccines. It was originally validated for COVID-19 Vaccination uptake (N=439). This study aimed to further validate the VAM™, by investigating whether VAM™ scores predict self-reported uptake of vaccination against childhood flu.

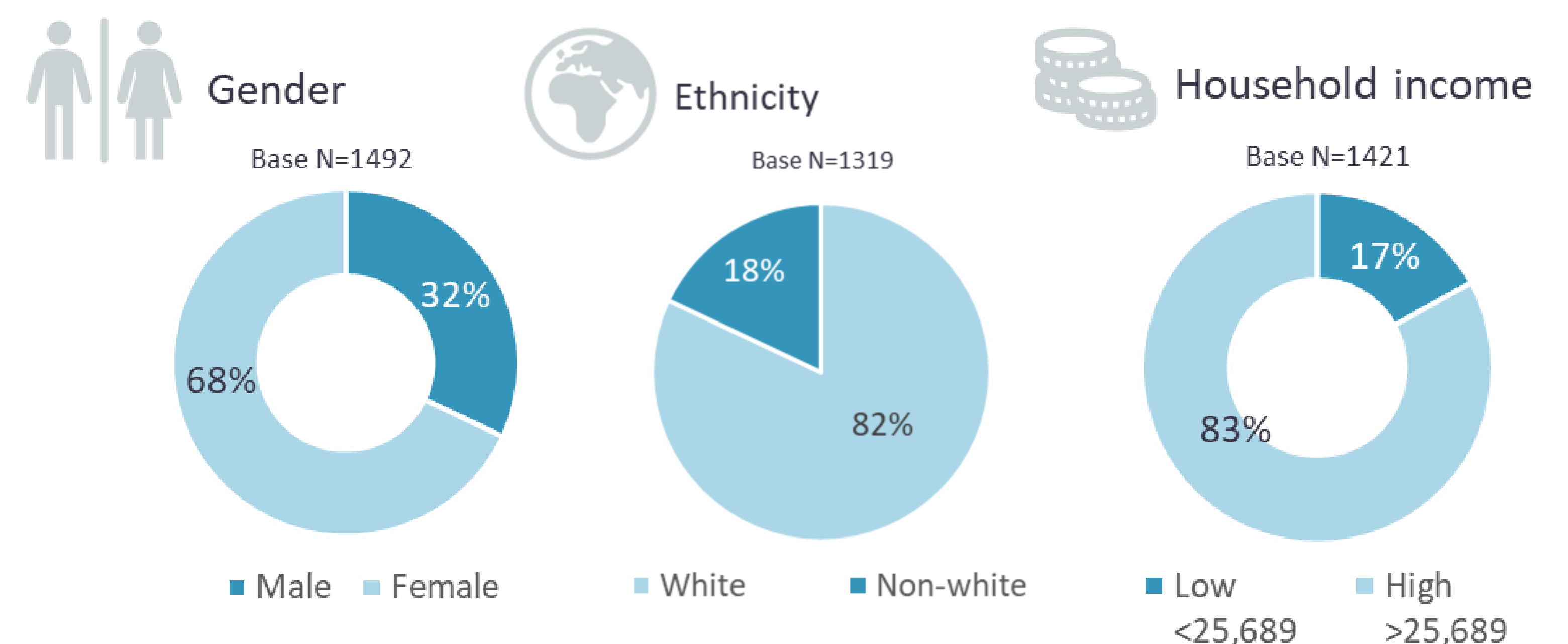


Figure 1: Parent demographics for gender, ethnicity and household income.

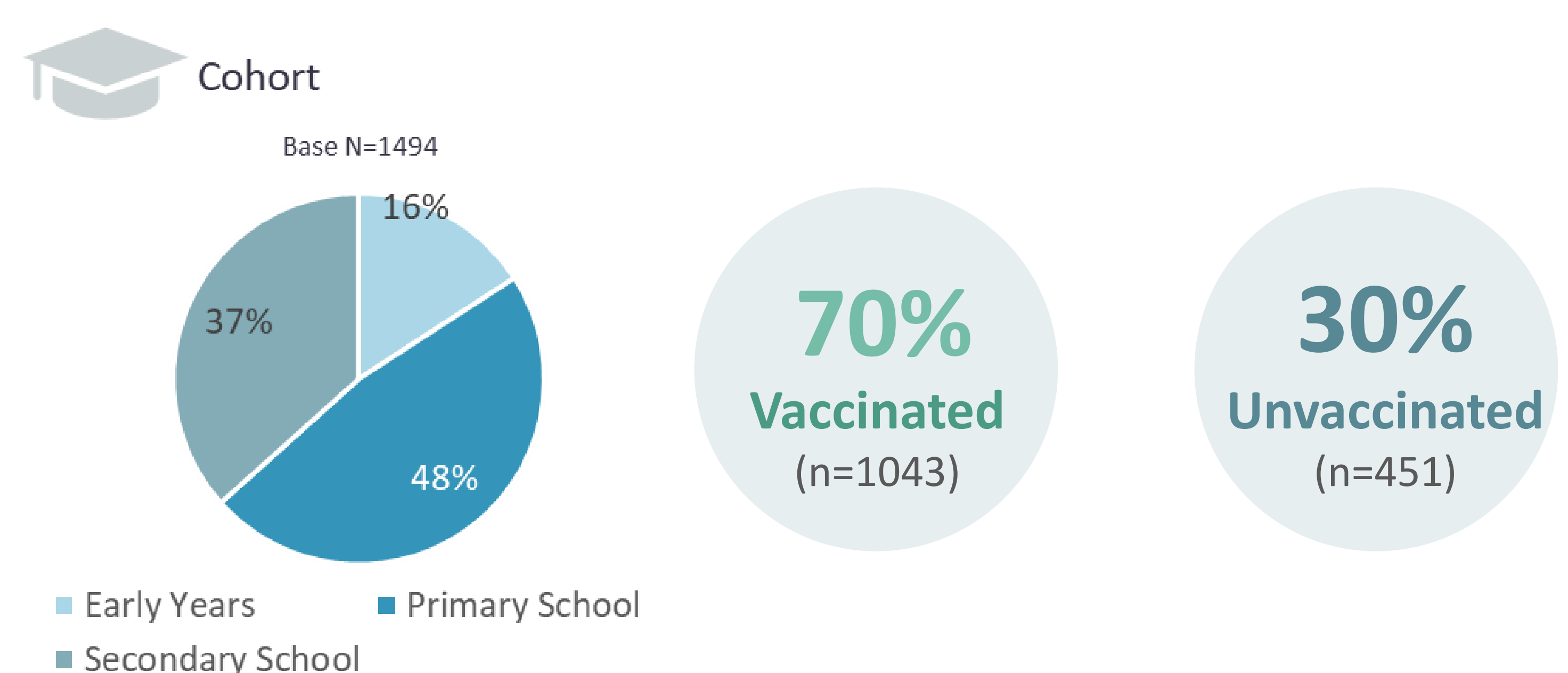
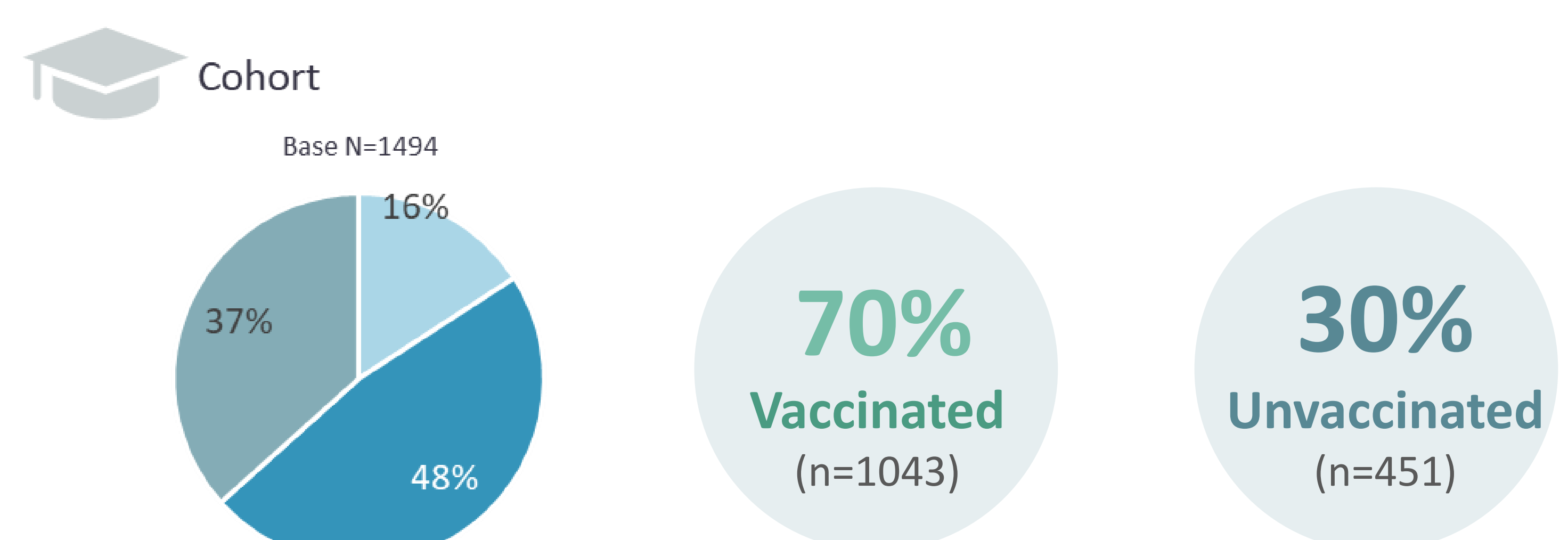


Figure 2: Child demographic for school cohort.

Figure 3: Parent response on acceptance and willingness to accept vaccination for their child.*



Conclusion

- VAM™ scores strongly predicted childhood flu vaccine uptake
- The VAM™ is a pragmatic new tool to segment people into levels of activation and understand the reasons driving vaccine uptake and refusal
- The VAM™ can be applied in public health interventions to support informed decisions about vaccination

References

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* For self-reported uptake, n=118 (8%) had not yet decided whether to vaccinate their child, and therefore their uptake data refers to their intentions to vaccinate.